



2022: Special Issue "Medical Ethics and Professionalism" ISSN: 2660-4159

Study of Toxic-Hygienic Effects of Zaragen Insects in Experimental Animals

1. H. Zh. Salomova

¹ Bukhara State Medical Institute,
Bukhara, Uzbekistan

Annotation: Today, solving the food problem is the only important issue that requires increasing the productivity of food and agricultural crops on the planet. Therefore, it requires extensive use of pesticides to protect plants from various diseases and insects. As a result of the growing chemicalization of the national economy, the production and use of chemical compounds used in industrial enterprises and agriculture is constantly growing. Also, the effects of chemical compounds, semi-intermediate products, wastes on the human body, which are formed during the production process, are not harmless in all cases. The study and evaluation of the toxicity of new chemicals requires the evaluation of technological processes, the development of hygienic standards, the prevention of occupational poisoning and other measures. Therefore, we rely on the results of research in experimental animals to assess the impact of chemical compounds used in agriculture on human health.

Key words: pesticides, chemical compounds, insecticides, synthetic pyrethroids, toxicity, pesticide poisoning.

The problem of food in the world is so urgent tonight that the only way to solve it is to develop technology to increase crop yields. It should be noted that the loss of agricultural crops from pests and weeds is very high worldwide [1,2]. The use of chemical protection against weeds, pests and plant diseases is one of the main measures to increase the productivity of agricultural crops [2,3].

With the development of the chemical industry in the 50s of the last century, scientists have developed a large number of different drugs, some of which have been found to have pesticide activity. It should be noted that many insecticides, synthetic pyrethroids are used in practice against chemicals used in agriculture against plant pests and diseases. For example, mainly synthetic pyrethroids and organophosphorus compounds were used against bipolar pests, DDT in African countries, partly in China, 98-100% of lindane in South Asia, 12-13% of hexachlorane dichloroorganic compounds [3].

Among pesticides used in agriculture, insecticides have a special place. Artificial pyrethroids are widely used in insecticidal chemicals. Insecticides belonging to this class have low toxicity when ingested once. However, pyrethroids are distinguished by their environmental resistance. Such properties cause them to accumulate in the soil and move along the soil-plant chain. Causes contamination of plant-derived foods

[2,4].

The direction of crop protection requires minimizing the area to be treated with pesticides [2,4]. However, the rapid development of globally used agriculture, along with increasing crop yields and large-scale economic efficiency, will lead to the introduction of new biologically active substances into the environment. This, in turn, further complicates the problem of protecting nature from chemicals [3,5]. The rapid development of the chemical, pharmaceutical and machine-building industries around the world and the use of large amounts of pesticides in agriculture and the domestic sector pose an unprecedented threat to public health. In the process of rapid chemicalization of agriculture, the protection of public health is of concern not only to agricultural, chemical and medical personnel, but also to the general public [1,2]. Most pesticides used in agriculture are highly resistant in nature, maintaining their biological activity under natural conditions. Allowing pesticides to be used in agriculture is the primary task of determining their toxicity levels, studying long-term exposure complications [1,4].

An important task is to improve the quality of medical care provided to the population of the country, including the prevention of occupational diseases, pesticide poisoning, protection of public health from pesticides used in agriculture, prevention of pesticide pollution of the biosphere. Article 7 of the Law of the Republic of Uzbekistan "On protection of agricultural crops from pests and weeds" stipulates that the Ministry of Health should assess the toxicological properties of pesticides, develop safe hygienic norms and regulations for their use in agriculture. . Article 15 of this law stipulates that standards for air protection shall be developed and approved by the Ministry of Health of the Republic of Uzbekistan and the Republican Committee for Ecology and Environmental Protection.[5,6].

Among pesticides used in agriculture, insecticides have a special place. Artificial pyrethroids are widely used in insecticidal chemicals. Insecticides belonging to this class have low toxicity when ingested once. However, pyrethroids are distinguished by their environmental resistance. Such properties cause them to accumulate in the soil and move along the soil-plant chain. Causes contamination of plant-derived foods [6,7].

The direction of crop protection requires minimizing the area to be treated with pesticides [2,4]. However, the rapid development of globally used agriculture, along with increasing crop yields and large-scale economic efficiency, will lead to the introduction of new biologically active substances into the environment. This, in turn, further complicates the problem of protecting nature from chemicals [7,8]. The rapid development of the chemical, pharmaceutical and machine-building industries around the world and the use of large amounts of pesticides in agriculture and the domestic sector pose an unprecedented threat to public health. In the process of rapid chemicalization of agriculture, the protection of public health is of concern not only to agricultural, chemical and medical personnel, but also to the general public [9,10]. Most pesticides used in agriculture are highly resistant in nature, maintaining their biological activity under natural conditions. Allowing pesticides to be used in agriculture is the primary task of determining their toxicity levels, studying long-term exposure complications [11,12].

An important task is to improve the quality of medical care provided to the population of the country, including the prevention of occupational diseases, pesticide poisoning, protection of public health from pesticides used in agriculture, prevention of pesticide pollution of the biosphere. Article 7 of the Law of the Republic of Uzbekistan "On protection of agricultural crops from pests and weeds" stipulates that the Ministry of Health should assess the toxicological properties of pesticides, develop safe hygienic norms and regulations for their use in agriculture. . Article 15 of this law stipulates that standards for air protection shall be developed and approved by the Ministry of Health of the Republic of Uzbekistan and the Republican Committee for Ecology and Environmental Protection[13,14].

The aim of the study is to develop hygienic norms and regulations to ensure the level of danger of Zaragen insecticide to humans and its safety in hot climates for consumers of atmospheric air, workplace air, water bodies, soil, food and agricultural products.

Research objectives:

Study of the acute toxicity of the insecticide "Zaragen", the assessment of the irritability of the mucous membranes and skin, the average and lethal value;

selection of the chronic toxicity of the insecticide and the degree of accumulation in the body, the maximum accumulation of the insecticide in the body and the average daily dose;

assessment of toxicity, long-term complications, ie embryotoxic, gonadotoxic, mutagenic, oncogenic mechanisms of action based on the chemical structure of the insecticide;

Today, solving the food problem is the only important issue that requires increasing the productivity of food and agricultural crops on the planet. Therefore, it requires extensive use of pesticides to protect plants from various diseases and insects. As a result of the growing chemicalization of the national economy, the production and use of chemical compounds used in industrial enterprises and agriculture is constantly growing. Also, the effects of chemical compounds, semi-intermediate products, wastes on the human body, which are formed during the production process, are not harmless in all cases. The study and evaluation of the toxicity of new chemicals requires the evaluation of technological processes, the development of hygienic standards, the prevention of occupational poisoning and other measures. Therefore, we rely on the results of research in experimental animals to assess the impact of chemical compounds used in agriculture on human health [15,14].

The toxicity of synthetic pyrethroids in warm-blooded animals is low. Most synthetic pyrethroids have low toxicity when ingested. Representatives of this class also have a tendency to accumulate less in the body (Oushideko G.G., and co-authors, 2016). The biological activity of synthetic pyrethroids depends on their chemical structure. In addition, the toxicity of pyrethroids is also related to their level of water solubility. For example, deltamethrin has a water solubility of 5 mg / l at a temperature of 220 and an average lethality rate of 4100–5000 mg / kg for mice, a water solubility of Detsis is 580 mg / l, and an average lethality is 780 mg / kg.

In acute poisoning with synthetic pyrethroids, the clinical signs are almost the same and mainly these symptoms are manifested in injuries of the central nervous system.

A study by G.I. Vishnevskaya (1995) found that when diphenylamide was administered once to the stomach of mice, it had low toxicity. Symptoms of acute poisoning revealed signs of injury to the central nervous system. As a result of inspections, the insecticide was approved for use in agriculture.

In the available literature, the negative effects of synthetic pyrethroids on the functional state of the kidney have been identified (Panshina T.N., 2008). In this case, cases of glomerulonephritis, albuminuria in the kidneys were observed. The effect of pyrethroids on the functional state of the kidney has also been proven in humans.

The study of the chronic effects of the chemical drug in experimental animals is important for the development of their safe parameters for the environment and the human body. When sumicidin was administered to experimental animals at doses of 600 and 300 mg / kg, 90 and 83% of animals died, respectively, in 2 months [85; 74-77b]. When Detsis was administered daily at 396 mg / kg, 2 out of 6 rats were administered 184 mg / kg after 4 months, and 1 rat died. This means that synthetic pyrethroids have a low concentration in the body.

Poisoning with pyrethroids also leads to morphological changes in the blood [86; 42 b].

The aim of the study is to develop hygienic norms and regulations to ensure the level of danger of Zaragen insecticide to humans and its safety in hot climates for consumers of atmospheric air, workplace air, water bodies, soil, food and agricultural products.

Research objectives:

Study of the acute toxicity of the insecticide "Zaragen", the assessment of the irritability of the mucous membranes and skin, the average and lethal value;

selection of the chronic toxicity of the insecticide and the degree of accumulation in the body, the maximum accumulation of the insecticide in the body and the average daily dose;

assessment of toxicity, long-term complications, ie embryotoxic, gonadotoxic, mutagenic, oncogenic mechanisms of action based on the chemical structure of the insecticide;

Today, solving the food problem is the only important issue that requires increasing the productivity of food and agricultural crops on the planet. Therefore, it requires extensive use of pesticides to protect plants from various diseases and insects. As a result of the growing chemicalization of the national economy, the production and use of chemical compounds used in industrial enterprises and agriculture is constantly growing. Also, the effects of chemical compounds, semi-intermediate products, wastes on the human body, which are formed during the production process, are not harmless in all cases. The study and evaluation of the toxicity of new chemicals requires the evaluation of technological processes, the development of hygienic standards, the prevention of occupational poisoning and other measures. Therefore, we rely on the results of research in experimental animals to assess the impact of chemical compounds used in agriculture on human health.

Toxicological testing of Zaragen insecticide was performed in white non-breeding rats. The acute toxicity of the drug was studied in white rats weighing 150-200 g. All experiments were performed while maintaining environmental and biological safety.

The acute toxicity of the drug was studied on the basis of a single injection into the stomach of experimental animals through a tube. The experimental animals were divided into 4 groups.

I-group control group-6 rats;

Group II experimental group-6 rats;

Group III experimental group -6 rats;

Group IV experimental group -6 rats were obtained.

Acute experiments were performed on 2 breeds of rats (male and female). The total number of experimental rats was 48.

An aqueous solution of Zaragen insecticide was injected into the stomachs of the experimental rats using a metal probe:

Group I - distilled water;

Group II-1000mg / kg;

III group-3000mg / kg;

Group IV-6000mg / kg.

The volume of fluid administered once to the stomach of the experimental rats was 4 ml / l.

Rats were observed for 30 days. Attention was paid to the general condition of the rats, the appearance of clinical signs. -maximum tolerable amount (LD₀, SD₀); -Most killing rate (LD 100, SD 100); -Hypersensitivity rate (Limac) was detected.

§2.2. Methods for studying the irritating properties of Zaragen insecticide on the skin and mucous membranes of the eyes

The excitatory properties of the insecticide on the skin and mucous membranes of the eye N.E. Pp. 252-253].

A method for studying the irritating effects of Zaragen insecticide on the skin.

The irritating effect of Zaragen insecticide on the skin was studied in male rats (weighing 150-200 grams). The rats were divided into 2 groups.

Group I 6 rat-control groups;

Group II 6 rat-experimental groups.

A 2x2 cm fur of the abdomen of the rats was cleaned and an aqueous solution of Zaragen insecticide was applied to the cleaned skin surface with 20 mg per cm² area. Distilled water was instilled into the skin of the control group. After 4 hours of exposure, the drug was washed off.

The skin reaction to the insecticide was observed for 1, 4, 24, and 48 hours. Attention was paid to redness, swelling, wounds, cracks, bleeding on the skin. The degree of redness of the skin was measured using a calorimetric ruler of S.V. Suvorov (S.V. Suvorov and co-authors, 1977) [7,15].

A method for studying the irritating properties of Zaragen insecticide on the mucous membrane of the eye.

The irritating property of Zaragen insecticide on the mucous membrane of the eye has been studied in rats. 6 controls and 6 experimental rats were obtained for the experiment. Experiment using a glass pipette into the eyes of rats

Aqueous solution of 50 mg (2 drops) of Zaragen insecticide was instilled.

Distilled water was instilled into the eyes of the control group.

It was observed after 15 minutes and for 1, 24, 48, and 72 hours. The eye irritating effect of the drug was calculated on a scale of points.

0- no reaction;

1- light redness of the conjunctiva;

2- conjunctiva reddened and white patch slightly reddened;

3- conjunctiva and white membrane are very red, purulent;

Three cases were added, and the averaging property of the drug was assessed.

The toxicity of synthetic pyrethroids in warm-blooded animals is low. Most synthetic pyrethroids have low toxicity when ingested. Representatives of this class also have a tendency to accumulate less in the body (Oushideko G.G., and co-authors, 2016). The biological activity of synthetic pyrethroids depends on their chemical structure. In addition, the toxicity of pyrethroids is also related to their level of water solubility. For example, deltamethrin has a water solubility of 5 mg / l at a temperature of 220 and an average lethality rate of 4100–5000 mg / kg for mice, a water solubility of Detsis is 580 mg / l, and an average lethality is 780 mg / kg.

In acute poisoning with synthetic pyrethroids, the clinical signs are almost the same and mainly these symptoms are manifested in injuries of the central nervous system.

A study by G.I. Vishnevskaya (1995) found that when diphenylamide was administered once to the stomach of mice, it had low toxicity. Symptoms of acute poisoning revealed signs of injury to the central nervous system. As a result of inspections, the insecticide was approved for use in agriculture.

In the available literature, the negative effects of synthetic pyrethroids on the functional state of the kidney have been identified (Panshina T.N., 2008). In this case, cases of glomerulonephritis, albuminuria in the kidneys were observed. The effect of pyrethroids on the functional state of the kidney has also been proven in humans.

References

1. Salomova Kh. J., Kosimov X.O. Ecological–Hydinic Aspects and Safety Parameters of the Use of the Zaragen insecticide in Agriculture //American Journal of Medicine and Medical Sciences–2020–10 (4)/ –P.266-268 (14.00.00; №2).
2. Х.Ж. Саломова. Гигиеническое обоснование влияния «Зараген» на работников в сельском хозяйстве // Вестник врача–Самарканд.-№2 (99), 2021, С.85-88 (14.00.00; №20).
3. Саломова Х.Ж.,Касимов Х.О., З.Ж.Жумаева. «Гигиенические обоснования допустимой нормы безопасности инсектицида «Зараген» в некоторых объектах окружающей среды» //Вестник врача. Самарканд-2019–№4.–С.104-108 (14.00.00; №20).
4. HJ Salomova //Ecological-Hygienic Aspects and safety parameters of the Use of the zaragen insecticide in Agriculture// American Journal of Medicine and Medical Sciences.–2020–10 (4).-P C 267-269
5. Ibrohimov K.I. Features of Labor in Agriculture // CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES // . Voleme: 02 Issue:07| Jan-Feb 2022 ISSN: 2660-4159.- P 87-91
6. Zokirov V.Z. (2021). CHRONIC LIVER DISEASE AND COVID-2019 (LITERATURE REVIEW AND OWN DATA) // RESEARCH JOURNAL OF TRAUMA AND DISABILITY STUDIES. Vol.1. December-2021 – P. 1–6
7. Manasova I.S., Doktor Axborotnomasi. Analysis of features Opinions on the Basic Components of Healthy Lifestyle 2021, No. 1 (98) ISSN 2181-466X\
8. Manasova I.S. The Level of Healthy Lifestyle of Students// European Journals of Psychology. ISSN:1841-0413. page 149-155
9. Muxamedova Z.R., THE COURSE OF CHRONIC LIVER DISEASE IN PATIENTS WITH COVID-2019 // THE AMERICAN JOURNAL OF MEDICAL SCIENCES AND PHARMACEUTICAL RESEARCH . Volume 03 Issue 09, 2021 ISSN 2689-1026– P. 69-74
10. Muxamedova Z.R., THE COURSE OF CHRONIC LIVER DISEASE IN PATIENTS WITH COVID-2019// THE AMERICAN JOURNAL OF MEDICAL SCIENCES AND PHARMACEUTICAL RESEARCH . Volume 03 Issue 09, 2021 ISSN 2689-1026– P. 69-74
11. Manasova I.S., Academia An International Multidisciplinary Research Journal. Features of labor of workers in agro-industrial labor 10.5958 \ 2249-7137.2020.01622.5 .c.958-962.[6]
12. Manasova I.S., Academia An International Multidisciplinary Research Journal. Analysis of working conditions by parameters of the physiological state of workers cotton plant 10.5958 / 2249-7137.2020.01634.1[7]
13. Manasova I.S., Yadgarova Sh.S., Analysis of Indicators of Physical Development of Preschool children // Central asian journal of medical and natural sciences. Volume; 02 Issue; 02 / march-april 2021 ISSN; 2660-4159.154-157.[9]
14. Manasova I.S., Mansurova M.Kh., Youth's Look For A Healthy Lifestyle // Central asian journal of medical and natural sciences. Volume: 02 issue: 02 March –april 2021 ISSN; 2660-4159.P.149-153.[10,11]
15. Ядгарова Ш. С. Антропометрические Показатели Детей Города И Сельской Местности //CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES. – 2021. – С. 319-322.